IN THE CLAIMS

Please cancel claims 1-9 and add claims 10-21 as follows:

Claims 1-9 (cancelled)

10. (New) An X-ray apparatus for high-resolution X-ray diffraction of thin layers of single crystal, comprising:

a sample stage (8) holding a sample (16) having a substantially single crystal thin layer (18) at a front face (12) with the front face (12) oriented substantially normally to a predetermined normal direction (14);

a means (4,6) for generating a collimated beam of X-rays (11) at a predetermined target location (15) on the sample stage at an angle of between 0° and 60° to the normal direction, the beam having an angular divergence at the sample stage in the range 0.01° to 0.20°; and

an X-ray detector (10) arranged laterally of the sample stage for detecting X-rays scattered by the sample (16) to a predetermined range of angles to the normal direction (14), the angles in the predetermined range being in the range from 80° to 90°,

wherein the means for generating a collimated beam of X-rays comprises an X-ray source (4) and a slit (6) between the X-ray source and the sample stage.

11. (New) An X-ray apparatus according to claim 10 wherein the means for generating a collimated beam does not include a monochromator.

12. (New) An X-ray apparatus according to claims 10 or 11 wherein the X-ray detector (10) has a linear resolution in the normal direction (14) of less than 0.002 times the distance from the X-ray detector to the predetermined target location.

13. (New) X-ray apparatus according to claims 10 or 11 wherein the X-ray source (3) has a dimension of no more than 0.2mm in the direction normal to the beam in the plane containing the normal, the incident beam and the scattered X-rays.

14. (New) An X-ray apparatus according to any preceding claim wherein the X-ray detector (10) is an elongate X-ray detector extending in a direction parallel to the normal direction (14) for detecting in parallel X-rays diffracted by the sample as a function of distance along the normal direction and hence over a predetermined range of angles to the normal direction.

15. (New) An X-ray apparatus according to claims 10 or 11 wherein the position sensitive X-ray detector (10) is a solid state detector.

16. (New) An X-ray apparatus according to claims 10 or 11 wherein the substantially single crystal thin layer (18) is a semiconductor layer.

17. (New) Use of an X-ray apparatus according to claims 10 or 11 to measure the sample (16) the sample (16) being mounted on the sample stage (8) and oriented to diffract the collimated X-ray beam (11) onto the position sensitive X-ray detector (10).

18. (New) A method of high-resolution X-ray diffraction; comprising:

providing a sample stage and an X-ray detector located laterally of the sample stage;

mounting a sample having a substantially single crystal thin layer material extending in a plane on the sample stage;

directing an incident collimated beam of x-rays created without a monochromator onto the sample at an angle of 0° to 60° to the normal to the plane; and

measuring with the X-ray detector the X-rays diffracted by the sample to a range of angles in the range 80° to 90° to the normal to the plane.

19. (New) A method according to claim 18 wherein the incident beam has an angular divergence in the range 0.01° to 0.20°.

20. (New) A method according to claims 18 or 19 wherein the incident beam of X-rays is in a direction from 0° to 40° to the normal to the plane.

21. (New) A method according to claims 18 or 19 wherein the step of measuring the X-rays diffracted by the sample (16) includes recording the intensity of X-rays incident on the detector (10) simultaneously at a number of locations along the length of the detector.